



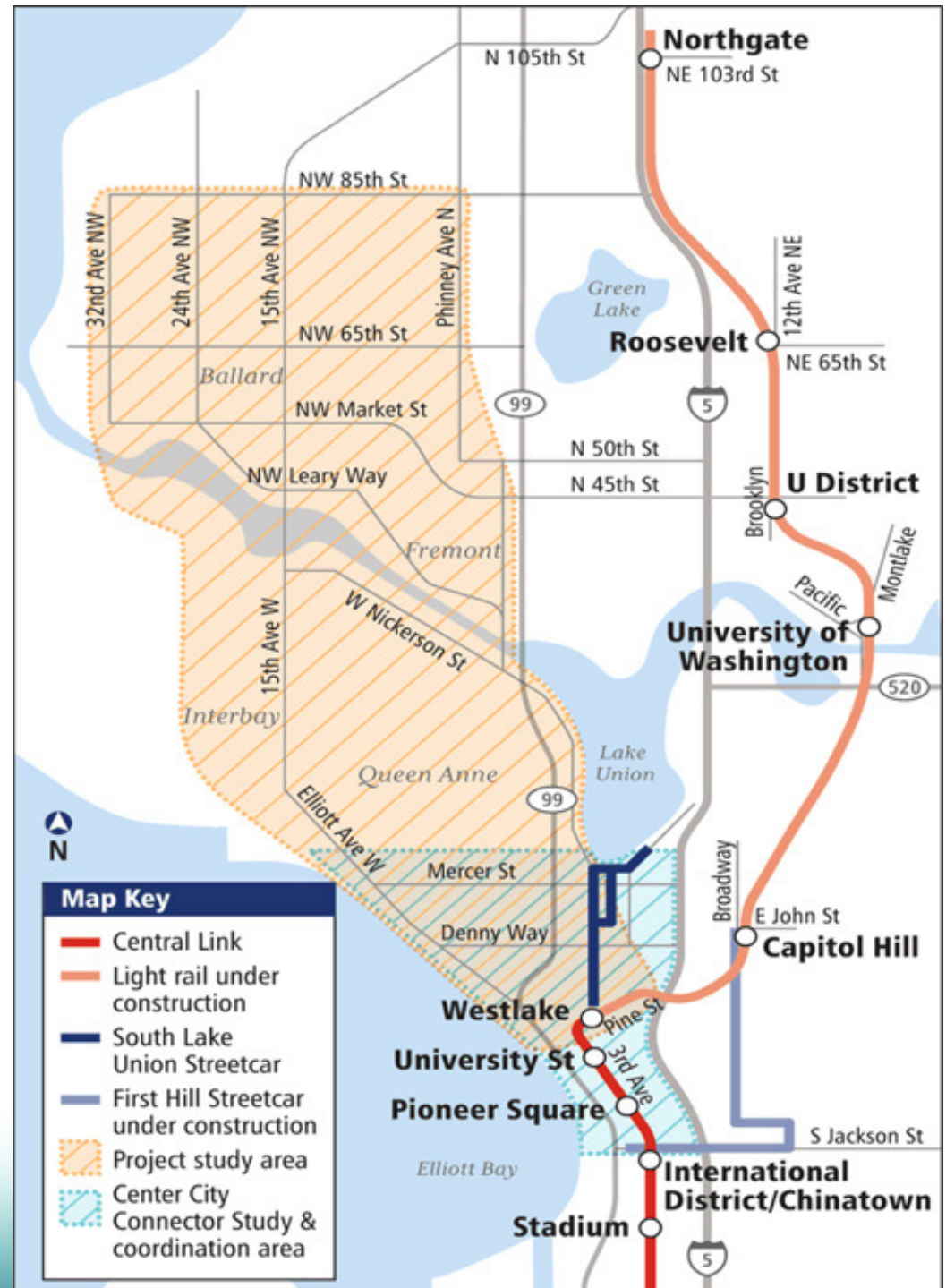
## Ballard to Downtown Seattle Transit Expansion Study Freight Advisory Board

August 20, 2013

# Ballard to Downtown Seattle

## Transit Expansion Study

- Support implementation of the Seattle's Transit Master Plan
- Support future ST Board discussions on High Capacity Transit options & expansion
- Study Modes: Link light rail & rapid Streetcar





# Study Activities:

1. Identify project goals and objectives
2. Identify potential alignments
3. Evaluate and refine light rail and rapid streetcar alignments and station locations
4. Develop ridership and cost estimates
5. Summarize and document findings
6. Present findings to City Council and the ST Board

# Screening Process and Criteria

BALLARD TO DOWNTOWN SEATTLE TRANSIT EXPANSION STUDY

## Level 1 Evaluation

Initial broad range of options gathered from agency outreach and public feedback received during the March 12, 2013 Open House and through the online mapping tool.

Initial screening:  
meets goals and objectives?

Options within the project area selected to meet technical constraints including connections to key transit markets, impacts to traffic and engineering feasibility.

Eight corridors identified for Level 1 evaluation.

Level 1 evaluation

★ (we are here)

## Level 2 Evaluation

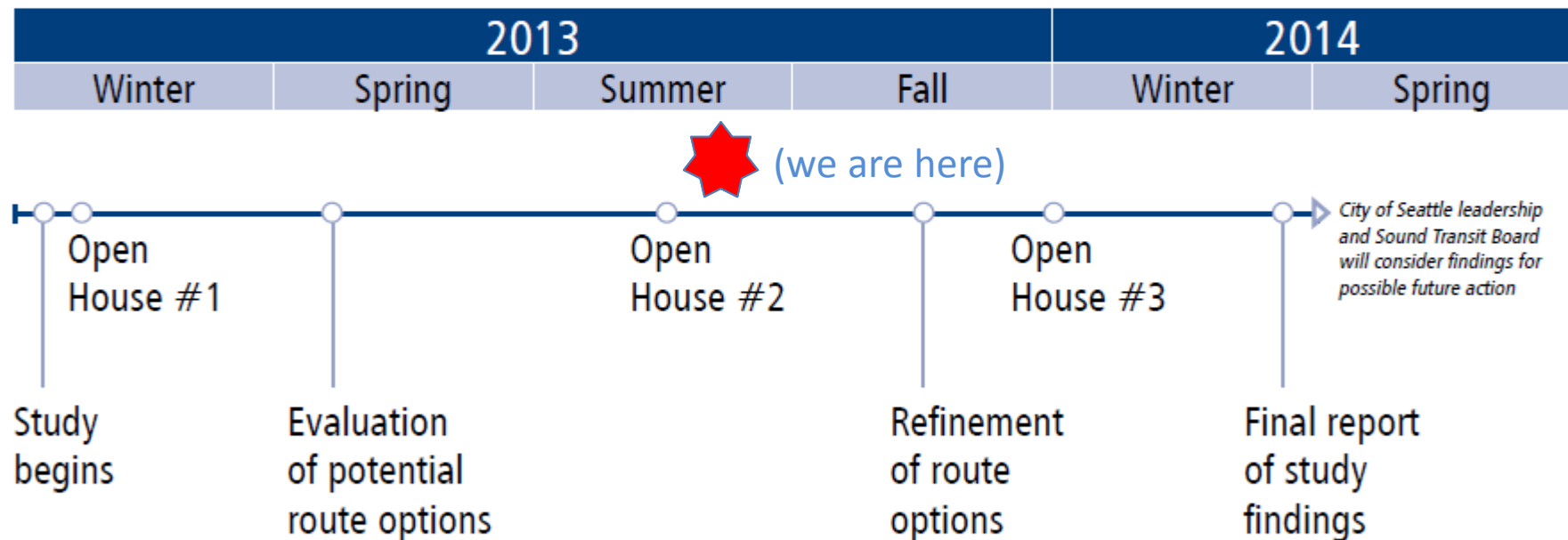
Corridors further refined and advanced for Level 2 detailed evaluation based on public input and technical constraints including ridership forecasts and quantitative technical analysis.

Level 2 evaluation

Evaluation results included in the Final Report.

# Study Timeline and Process

BALLARD TO DOWNTOWN SEATTLE TRANSIT EXPANSION STUDY



\*Schedule is subject to change

## Open House #1 – March 12<sup>th</sup>

- Project Goals Objectives
- Origin & destination
- Alignment options
- 150 participants in public meeting
- 269 online participants



## Open House #2 – June 27<sup>th</sup>

- Tier 1 Evaluation
  - Eight corridors
  - Urban areas served
- 170 participants in public meeting
- 1,200 online participants



# Goals and Objectives Results

## BALLARD TO DOWNTOWN SEATTLE TRANSIT EXPANSION STUDY

The participants of the March Open House and the online mapping tool generally supported all of the project's goals and objectives and ranked the majority as "important" or "very important." Three goals and objectives, highlighted below, were weighted "very important" more heavily than the others.

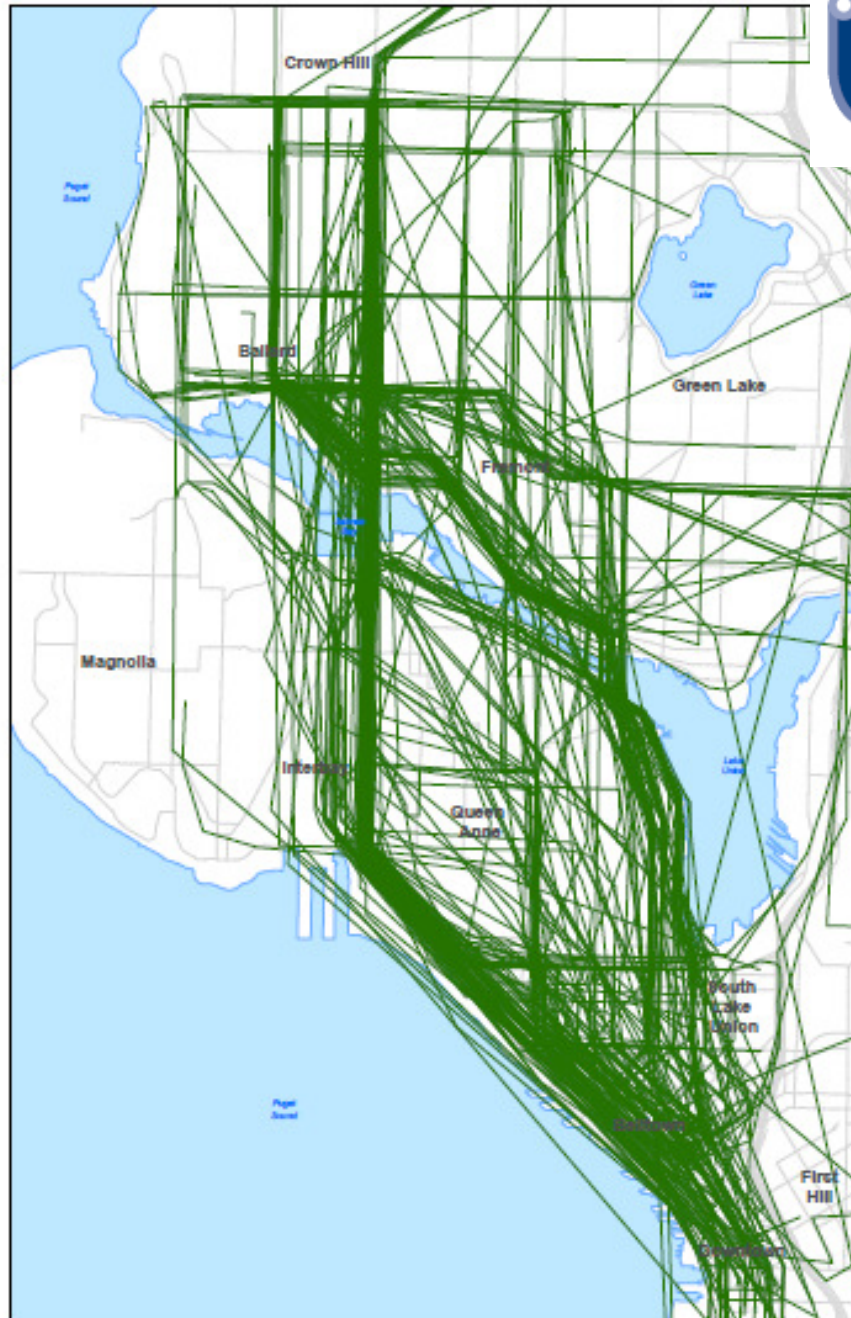
### Goals and Objectives Ranking

Goal/Objective	Not Important	Somewhat Important	Important	Very Important
Increase transit ridership by providing services that are reliable, frequent and efficient	0%	2%	12%	86%
Improve mobility options for residents and businesses between Ballard and Downtown Seattle	1%	6%	9%	84%
Support sustainable urban growth	2%	9%	21%	68%
Improve connection to the regional transit system	3%	12%	22%	63%
Efficient use of public funding	2%	15%	29%	54%
Preserve and enhance the environment	1%	16%	31%	52%
Provide equitable access for residents and businesses	3%	16%	31%	50%



## Routes Suggested Through Public Input

BALLARD TO DOWNTOWN SEATTLE TRANSIT EXPANSION STUDY



- 150 people attended the 1<sup>st</sup> open House
- 270 people participated in the online interactive mapping tool



# Eight Corridor Alternatives



## Interbay West/New Bridge

### Cost:

Market St to Downtown Seattle: \$750 - \$1,000 M

85th St to Market St: N/A

### Peak Period Travel Time:

Market St to Downtown Seattle: 14-19 min

85th St to Market St: N/A

**Ship Canal Crossing:** 140' Fixed Bridge

**Downtown** – At-grade, exclusive lane

**Interbay** – Elevated

**Crossing** – 140' Fixed bridge



## Interbay West/Ship Canal Tunnel

### Cost:

Market St to Downtown Seattle: \$2,500 - \$3,000 M  
85th St to Market St: N/A

### Peak Period Travel Time:

Market St to Downtown Seattle: 12-17 min  
85th St to Market St: N/A

**Ship Canal Crossing:** Tunnel

Downtown / QA – Tunnel

Interbay – Elevated

Crossing – Tunnel



# Ballard-to-Downtown Seattle High-Capacity Transit (HCT) Planning Study

## 20th Ave. - Corridor 1 and 2



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## 15th Avenue/Elevated

### Cost:

Market St to Downtown Seattle: \$1,500 - \$2,000 M

85th St to Market St: N/A

### Peak Period Travel Time:

Market St to Downtown Seattle: 11-16 min

85th St to Market St: N/A

**Ship Canal Crossing:** 140' Fixed Bridge

Downtown – Tunnel

Interbay – Elevated

Crossing – 140' Fixed bridge



## 15th Avenue/At-grade

### Cost:

Market St to Downtown Seattle: \$500 - \$750 M

85th St to Market St: Approx \$100 M

### Peak Period Travel Time:

Market St to Downtown Seattle: 13-18 min

85th St to Market St: Approx 5 min

**Ship Canal Crossing:** 70' Movable Bridge

**Downtown** – At-grade, exclusive lane

**Interbay** – At-grade, exclusive lane

**Crossing** – 70' Movable bridge

**Ballard/CH** – At-grade, exclusive lane

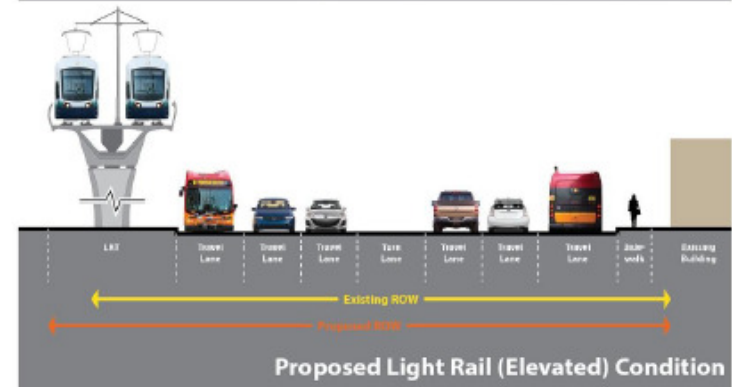


# Ballard-to-Downtown Seattle High-Capacity Transit (HCT) Planning Study

## 15th Ave. W - Corridor 3 and 4



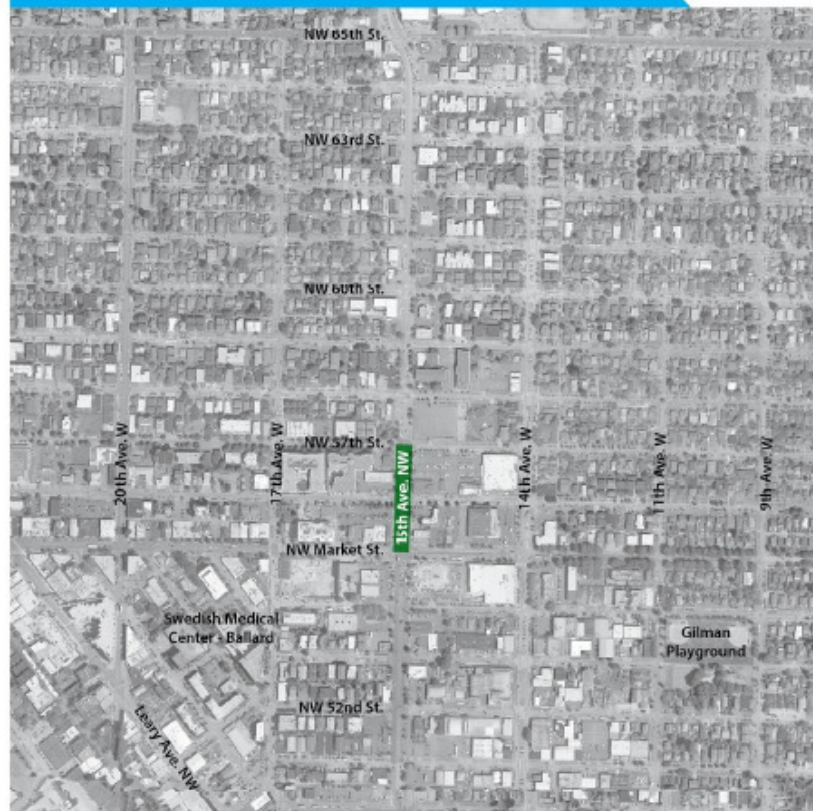
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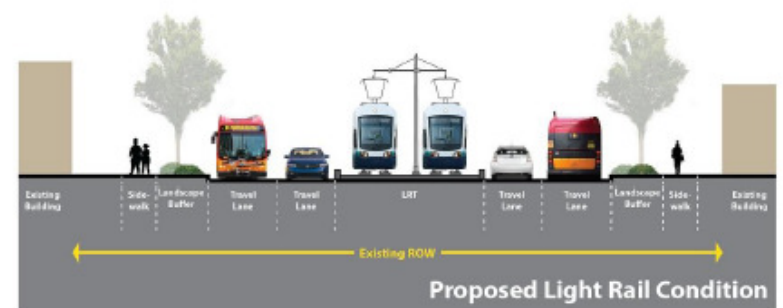
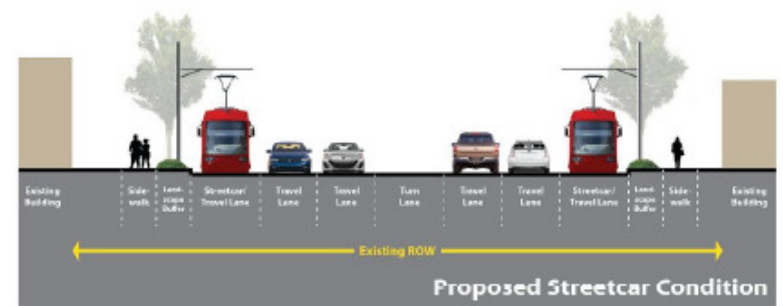
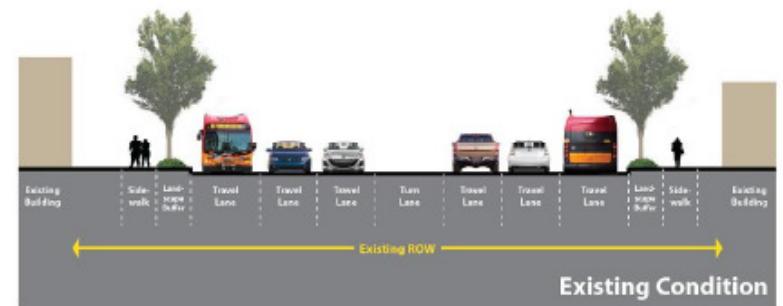
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# Ballard-to-Downtown Seattle High-Capacity Transit (HCT) Planning Study

## 15th Ave. NW - Corridor 4 and 7



North Arrow  
Not to Scale



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## Ballard-to-Downtown Seattle High-Capacity Transit (HCT) Planning Study

### 15th Ave. NW - Corridor 4 and 7



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May 2013





## Queen Anne Tunnel

### Cost:

Market St to Downtown Seattle: \$2,000 - \$2,500 M  
85th St to Market St: N/A

### Peak Period Travel Time:

Market St to Downtown Seattle: 15-20 min  
85th St to Market St: N/A

**Ship Canal Crossing:** 70' Movable Bridge

Downtown/QA – Tunnel

Crossing – 70' Movable bridge

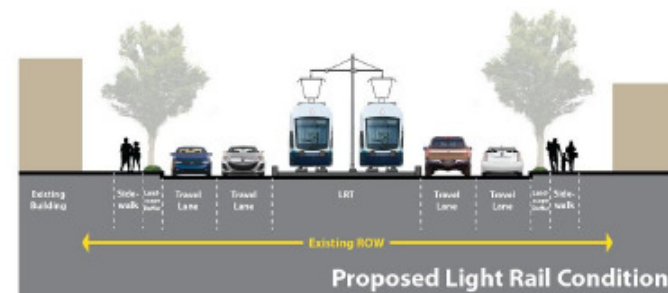
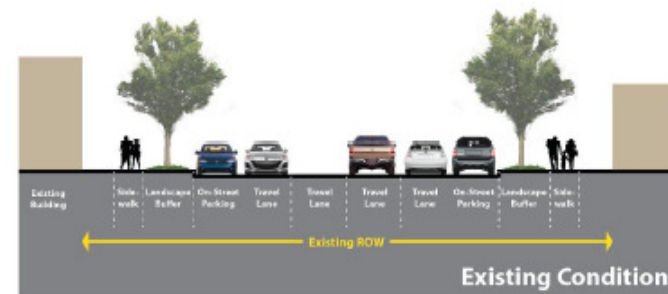
Leary/17th – At-grade, exclusive lane

# Ballard-to-Downtown Seattle High-Capacity Transit (HCT) Planning Study

## N 36th St. - Corridor 5, 7, and 8



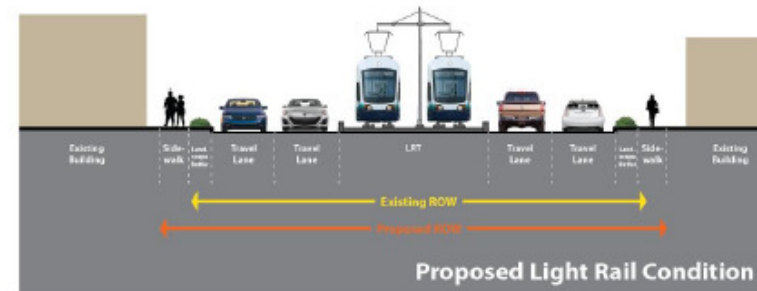
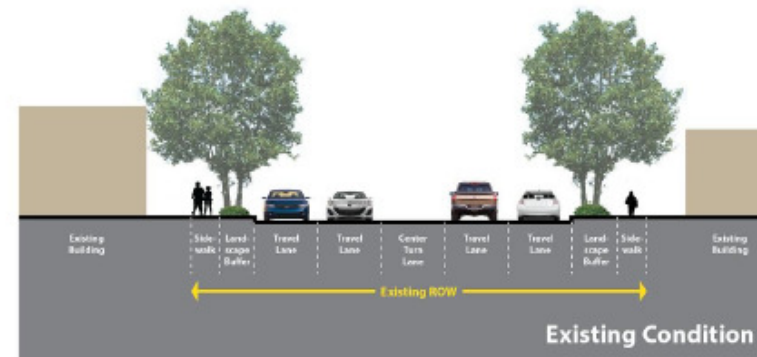
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# Ballard-to-Downtown Seattle High-Capacity Transit (HCT) Planning Study

## Leary Way NW - Corridor 5, 6, 7, and 8




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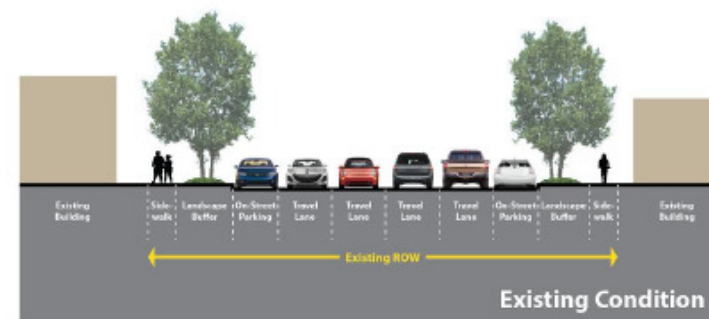


## High-Capacity Transit (HCT) Planning Study

## NW Leary Way - Corridor 5, 6, 7, and 8



 Not to Scale



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May 2013



## Westlake/Ship Canal Tunnel

### Cost:

Market St to Downtown Seattle: \$1,000 - \$1,500 M  
85th St to Market St: Approx \$100 M

### Peak Period Travel Time:

Market St to Downtown Seattle: 14-19 min  
85th St to Market St: Approx 6 min

**Ship Canal Crossing:** Tunnel

**Downtown** – At-grade, exclusive lane

**Westlake** – At-grade, exclusive lane

**Crossing/Leary** – Tunnel

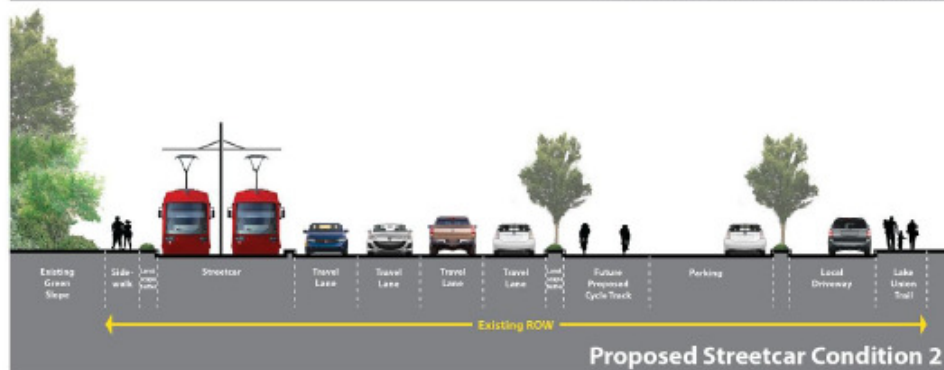
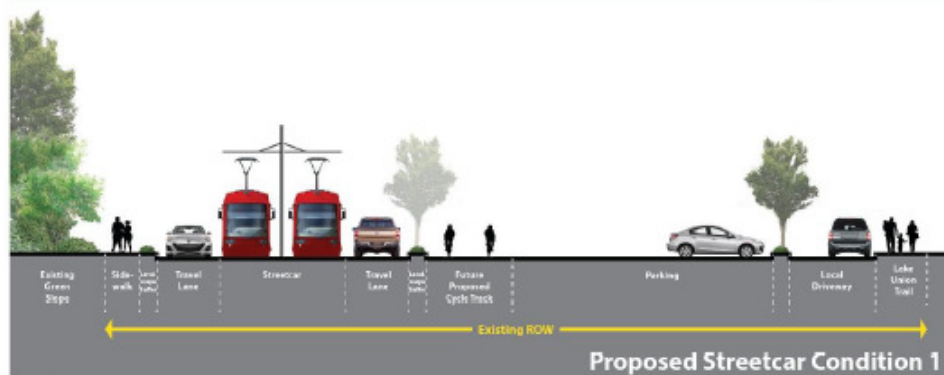
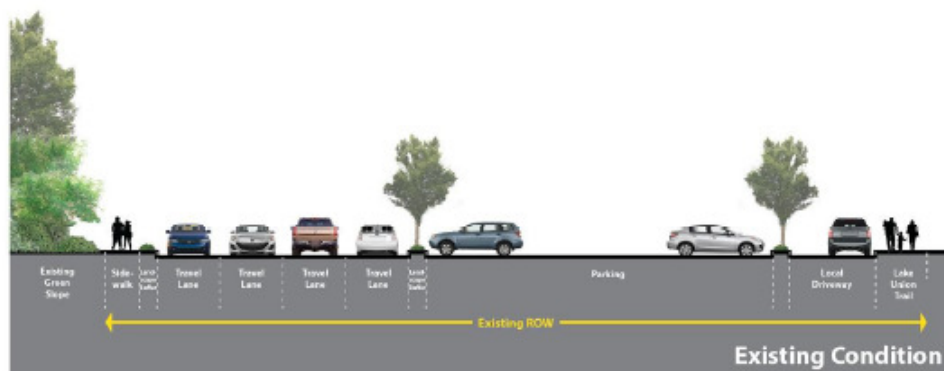
**Ballard/CH** – At-grade, exclusive lane

# Ballard-to-Downtown Seattle High-Capacity Transit (HCT) Planning Study

## Westlake Ave. N - Corridor 6 and 8



Not to Scale



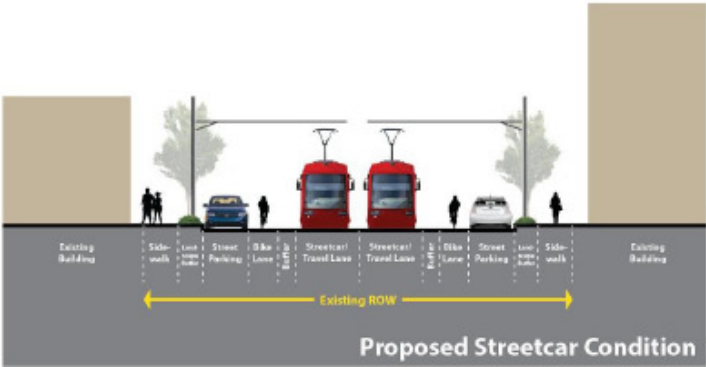
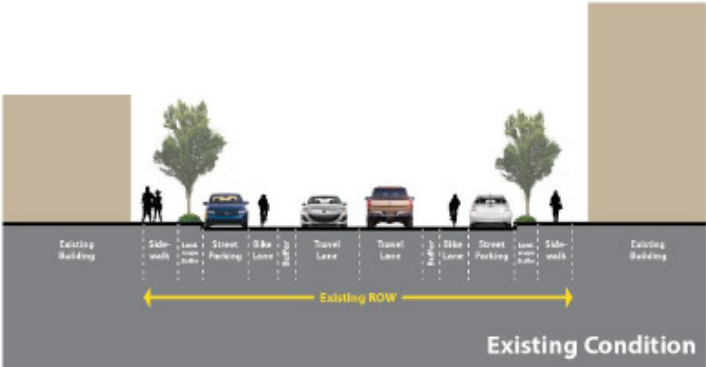
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**Ballard-to-Downtown Seattle**  
**High-Capacity Transit (HCT) Planning Study**

**Dexter Ave. N - Corridor 7**



**DRAFT**  
May 2013



## Westlake/New Bridge

### Cost:

Market St to Downtown Seattle: <\$500 M

85th St to Market St: Approx \$100 M

### Peak Period Travel Time:

Market St to Downtown Seattle: 17-24 min

85th St to Market St: Approx 6 min

**Ship Canal Crossing:** 70' Movable Bridge

**Downtown** – At-grade, shared lane

**Westlake** – At-grade, exclusive lane

**Crossing** – 70' Movable bridge

**Leary** – At-grade, exclusive lane

**24th** – At-grade, shared lane



# Level 1 Analysis and Evaluation Matrix\*

## BALLARD TO DOWNTOWN SEATTLE TRANSIT EXPANSION STUDY

	1 Interbay West/ New Bridge	2 Interbay West/ Ship Canal Tunnel	3 15 <sup>th</sup> Avenue/ Elevated	4 15 <sup>th</sup> Avenue/ At-grade	5 Queen Anne Tunnel	6 Westlake/Ship Canal Tunnel	7 Dexter/ Fremont Bridge	8 Westlake/ New Bridge
<b>► Goal: Increase transit ridership by providing services that are reliable, frequent, and efficient</b>								
Service to key transit travel markets	Ballard, Uptown, Belltown, Downtown	Ballard, Uptown, Belltown, Downtown	Ballard, Uptown, Belltown, Downtown	Ballard, Uptown, Belltown, Downtown	Ballard, Fremont, Upper QA, Uptown, Belltown, Downtown	Ballard, Fremont, SLU, Denny Triangle, Downtown	Ballard, Fremont, SLU, Denny Triangle, Downtown	Ballard, Fremont, SLU, Denny Triangle, Downtown
Number of at-grade signalized intersections traversed	16	0	0	28	10	19	36	27
Reliability of Ship Canal crossing	140' fixed bridge (no openings)	Tunnel (no openings)	140' fixed bridge (no openings)	70' movable bridge (reduced off-peak openings)	70' movable bridge (reduced off-peak openings)	Tunnel (no openings)	Fremont Bridge (off-peak openings)	70' movable bridge (reduced off-peak openings)
Peak period travel time (min) (with no bridge openings)	14–19	12–17	11–16	13–18	15–20	14–19	18–25	17–24
<b>► Goal: Improve mobility options for residents and businesses between Ballard and Downtown Seattle</b>								
Effects on traffic operations (general purpose traffic, freight mobility, local circulation and parking)	Moderately High Impacts	Low Impacts	Low Impacts	High Impacts	Moderate Impacts	Moderate Impacts	Moderately High Impacts	High Impacts
Effects on multimodal mobility (pedestrians, bicycle, and transit)	Moderately High Impacts	Low Impacts	Low Impacts	High Impacts	Moderate Impacts	Moderately High Impacts	Moderate Impacts	Moderate Impacts
<b>► Goal: Support sustainable urban growth</b>								
Opportunity for economic and transit-oriented development	Low	Moderately Low	Moderately Low	Moderately Low	Moderately High	High	High	Moderately High
<b>► Goal: Improve connection to the regional transit system</b>								
Ease of pedestrian connection to Westlake Link station	Moderately High	High	High	Moderately High	High	Moderately High	Moderately High	Moderately High
Connectivity to local bus network	High	High	High	High	Moderate	Moderately Low	Moderately Low	Moderately Low
<b>► Goal: Make efficient use of public financial resources</b>								
Conceptual cost estimate (2013 \$M)	\$750–\$1,000	\$2,500–\$3,000	\$1,500–\$2,000	\$500–\$750	\$2,000–\$2,500	\$1,000–\$1,500	<\$500	<\$500
Conceptual operations and maintenance cost estimate	Low Cost	Low Cost	Low Cost	Moderate Cost	High Cost	High Cost	High Cost	Moderate Cost
Construction challenges of major infrastructure elements	• Bridge over BNSF • 140' bridge over Salmon Bay	• Very long tunnel from CBD to SW Queen Anne via Seattle Center • Bridge over BNSF • Tunnel under Salmon Bay	• Long tunnel from CBD to SW Queen Anne • Elevated 15th Ave guideway • 140' bridge over Ship Canal	• 70' movable bridge	• Very long tunnel from CBD to Nickerson • Deep tunnel station under QA • 70' movable bridge	• Tunnel under Lake Union	• Use existing Fremont Bridge	• 70' movable bridge
Potential conflicts with major water, sewer, and power utilities	Moderate Conflicts	Moderately High Conflicts	Moderate Conflicts	Moderately High Conflicts	High Conflicts	Moderately High Conflicts	Moderately High Conflicts	Moderately High Conflicts
Potential availability and ease of access to maintenance and storage facility	North Port: High	North Port: High	Interbay/15th: Moderate	Interbay/15th: Moderate	Leary: Low	Leary: Low	Leary: Low	Leary: Low
<b>► Goal: Preserve and enhance the environment</b>								
Potential visual and natural environment impacts	Moderately High Impacts	Moderately Low Impacts	Moderately High Impacts	Low Impacts	Moderately Low Impacts	Low Impacts	Low Impacts	Moderately Low Impacts
<b>► Goal: Provide equitable access for residents and businesses</b>								
Number of census tracts served with medium and high concentrations of zero-car households	6	7	6	6	8	8	8	8

\*Analysis for Downtown Ballard (Market Street) to Downtown Seattle

# Level 1 Traffic Analysis

- Qualitative – no level of service analysis
- Identified/counted signalized intersections impacted
- Potential impacts to mobility
  - Reduction in travel lanes
  - Turn restrictions
  - Impacts to Seattle Major Truck Streets

# Level 2 Traffic Analysis

- Update Level 1 qualitative analysis of impacts to mobility for Level 2 corridors
- Add quantitative analysis at selected locations
- Level of service analysis
  - Intersections
  - Street segments
- Use traffic simulation software where appropriate



# Considerations for Freight & the Ballard Study

- Identify potential impacts
  - Reduction in SOV trips = more space for freight
  - Improved progression with TMP (at-grade only)
- Identify negative impacts and/or mitigation
  - Level of service
  - Facility needs, key freight access points, loading zones
- Continue to coordinate with Freight Access / Master Plan
- Implement Best Practices through design and construction
  - Work with specific stakeholders
  - Specific signal and timing solutions
  - new loading zones, revised routings
  - technology

# Next Steps

- Summer/Fall 2013: Corridor Tier 2 Evaluation
- December 2013: Outreach Meeting #3
- Early 2014: Final Report

# Ship Canal Crossing Project

- Currently funded in 2015
- Identified a benefit in advancing to 2014
  - To a parallel track with ST3 corridor studies and long range plan update



# High Growth Areas



## Ballard Urban Village

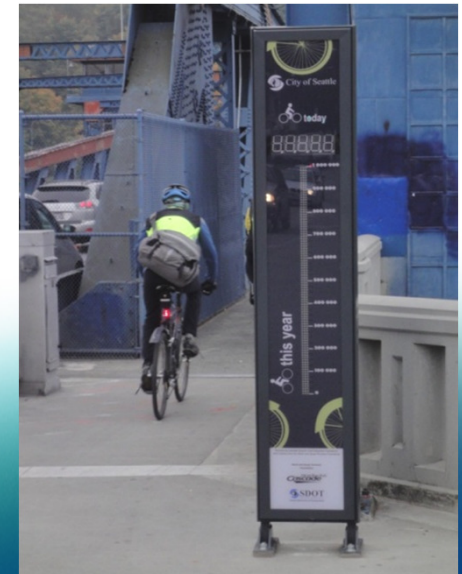
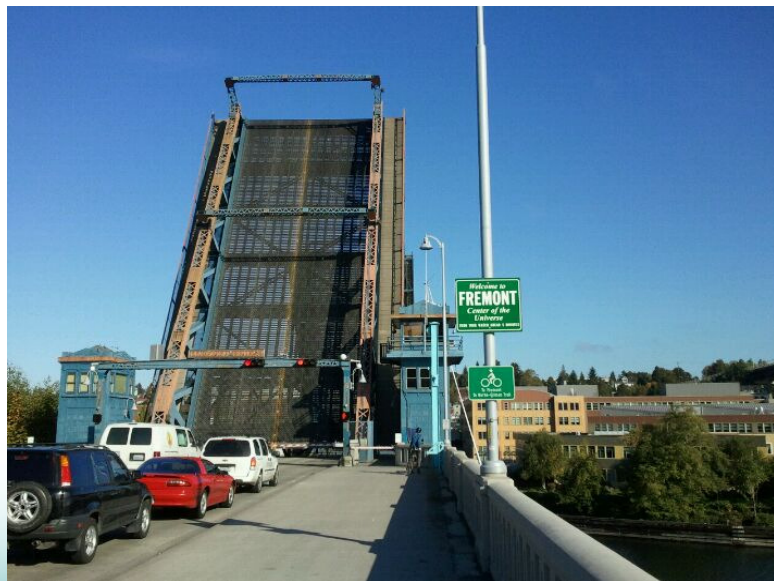
- Achieved 148% of the 2024 residential target
- Achieved 92% of the 2024 employment target

## Fremont Urban Village

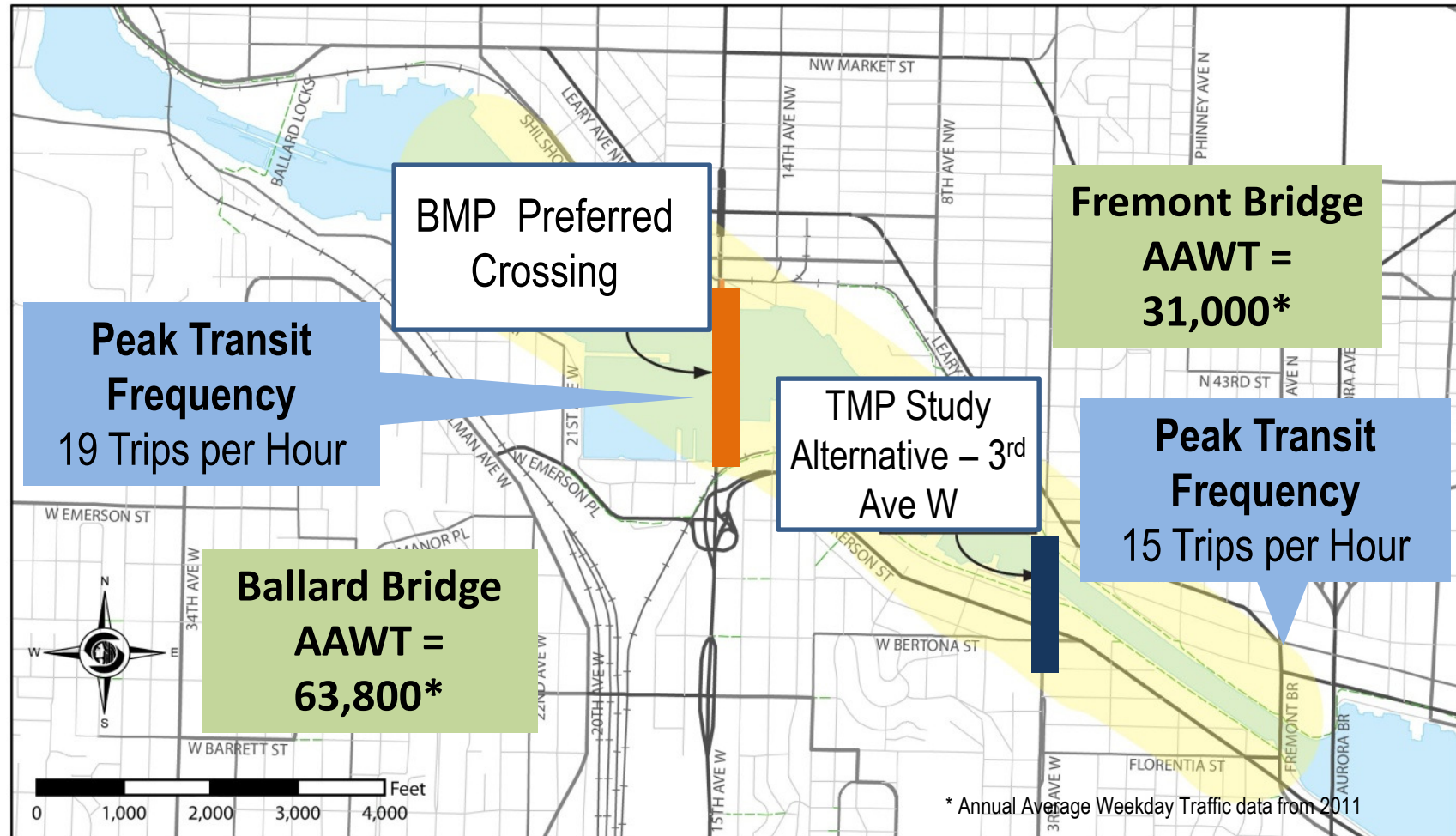
- Achieved 95% of the 2024 residential target
- Achieved 85% of the 2024 employment target

# Council-Adopted Plans

- 3 modal plans identify a new crossing
  - Transit Master Plan (2012)
  - Pedestrian Master Plan (2009)
  - Bicycle Master Plan (2007)
- The 2013 Draft BMP Update identifies crossing needs
  - Significant community outcry to improve the Ballard



# Crossing Volumes





# Crossing Study Considerations

- Consider mode compatibility and location
- Prioritize transit, bike and pedestrian connections
- Evaluate mix and match scenarios
  - Tunnel and high bridges - not compatible for bikes and pedestrians
    - Require a separate bike/pedestrian facility
  - New moveable bridge could include multiple modes
    - 70' bridge would require only infrequent opening
- Opportunity to reconfigure existing bridges
  - Increase bike and pedestrian space
  - Develop a couplet concept with an additional crossing

# Ship Canal Crossing Outcomes

If completed in 2014, concurrent with ST's HCT Corridor Studies, it advances:

- Feasibility analysis considering multiple modes
- Understanding of design alternatives and costs
- Leverages modal plan recommendation and is coordinated with Ballard to Downtown
- Costs to develop a funding package
- Potentially informs projects in:
  - BTG 2
  - ST Long Range Plan

